

**IN THE CLAIMS:**

Please amend the claims as set forth below. No new matter has been added.

1. (Previously Presented) A method for APol-DPSK transmission comprising:  
modulating an input optical signal according to a precoded electronic data signal  
by differential phase shift keying between two optical bits separated by an even number  
of bit periods to generate an encoded optical signal;

alternating the polarization of the encoded optical signal using a modulator such  
that successive optical bits have substantially orthogonal polarizations to generate an  
APol-DPSK signal; and

demodulating the APol-DPSK signal using an even bit delay line interferometer.

2. (Currently Amended) The method of claim [[10]] 1 wherein the  
modulation is performed by a phase modulator driven by a sinusoidal RF voltage.

3. (Currently Amended) The method of claim [[10]] 1 wherein the  
modulation is performed by a phase modulator driven by a train of square pulses.

4. (Currently Amended) The method of claim [[10]] 1 wherein the input  
optical signal is provided having a polarization oriented at a predetermined angle such  
that the polarization of successive optical bits of the transmitted APol-DPSK signal are  
substantially orthogonal.

5. (Currently Amended) The method of claim [[10]] 1 wherein the  
modulation is performed by a Mach-Zehnder modulator including a polarization rotation  
device in at least one arm.

6. (Original) The method of claim 5 wherein the polarization rotation device  
is a half-wave plate.

7. (Previously Presented) The method of claim 5 wherein at least one arm of the Mach-Zehnder modulator is driven by a sinusoidal RF voltage.

8. (Previously Presented) The method of claim 5 wherein at least one arm of the Mach-Zehnder modulator is driven by a train of square pulses running at half the bit rate.

9. (Previously Presented) A method of APol-DPSK transmission comprising:  
modulating an optical signal according to a precoded electronic data signal by differential phase shift keying between two optical bits separated by an even number of bit periods and performing polarization alternating such that successive optical bits have substantially orthogonal polarizations to generate an APol-DPSK signal;

wherein said modulating and said polarization alternating are performed simultaneously by a Mach-Zehnder modulator including a polarization rotation device in at least one arm, and

wherein input signals to both arms of the Mach-Zehnder modulator have polarizations that are the same.

10. (Currently Amended) The method of claim [[12]] 9 wherein the polarization rotation device is a half-wave plate.

11. (Currently Amended) The method of claim [[12]] 9 further comprising demodulating the APol-DPSK signal using an even bit delay line interferometer.

12. (Previously Presented) An optical transmitter for APol-DPSK transmission comprising:

a Mach-Zehnder (MZ) modulator having a half-wave plate in one arm, wherein input optical signals to both arms of the Mach-Zehnder modulator have polarizations that are the same; and

drive circuitry, coupled to the MZ modulator for driving the MZ modulator using a precoded data signal to simultaneously provide polarization alternation and optical data encoding of an optical signal received by the MZ modulator using differential phase shift

keying between two optical bits separated by an even number of bit periods to generate an APol-DPSK signal.

13. (Currently Amended) The transmitter of claim [[26]] 12 wherein at least one arm of the Mach-Zehnder modulator is driven by a sinusoidal RF voltage.

14. (Currently Amended) The transmitter of claim [[26]] 12 wherein at least one arm of the Mach-Zehnder modulator is driven by a train of square pulses running at half the bit rate.

15. (Currently Amended) The transmitter of claim [[26]] 12 wherein the Mach-Zehnder modulator comprises two complementary output ports, and wherein the transmitter further comprises a polarization beam combiner for combining outputs from the two output ports of the Mach-Zehnder modulator.

16. (Currently Amended) The transmitter of claim [[21]] 12 wherein at least one arm of the Mach-Zehnder modulator is driven by a sinusoidal RF voltage.

17. (Currently Amended) The transmitter of claim [[21]] 12 wherein at least one arm of the Mach-Zehnder modulator is driven by a train of square pulses running at half the bit rate.

18. (Previously Presented) An optical transmission system for APol-DPSK transmission comprising:

an optical phase-shift-keying (PSK) data modulator driven by a precoded electronic data signal to produce an optical DPSK signal, wherein the electronic data to be transmitted is optically encoded by the PSK data modulator as differential phase shift keying between two optical bits separated by an even number of bit periods;

a polarization alternator, optically coupled to the data modulator, to provide polarization alternation to the optical DPSK signal to produce an APol-DPSK signal; and demodulator, comprising an even bit delay line interferometer.